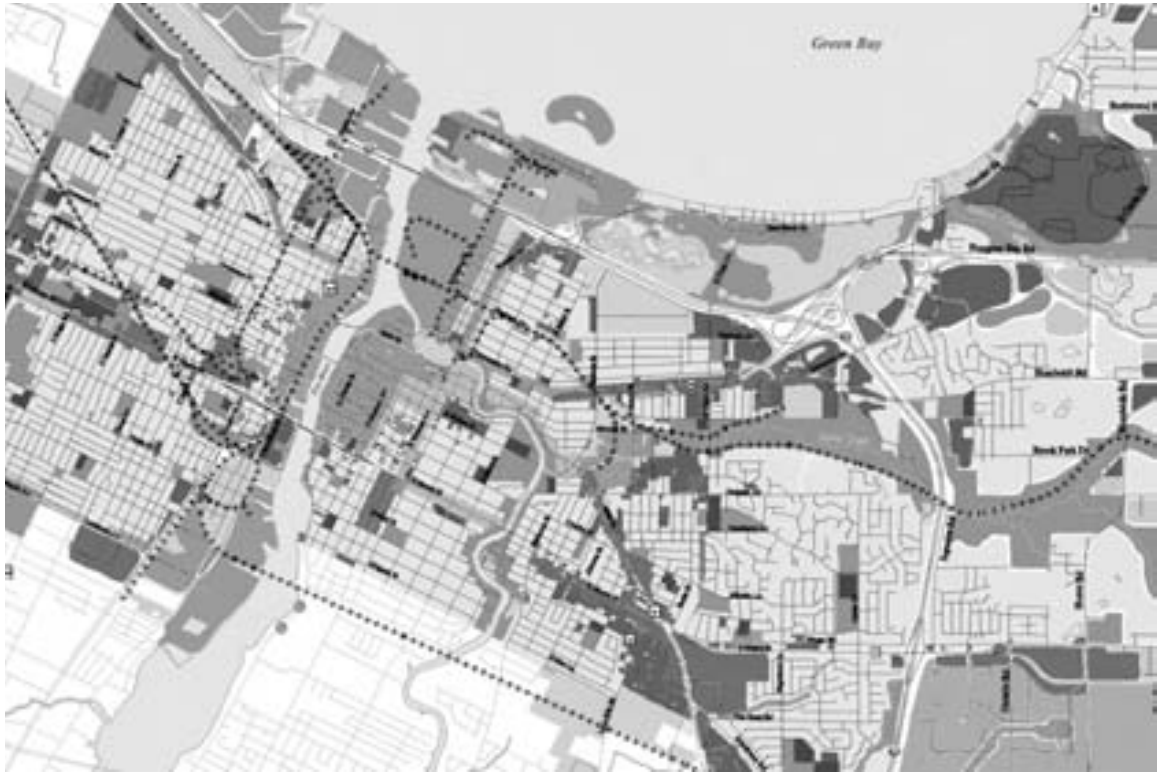
Public Utilities Analysis



Green Bay
Smart Growth 2022

Public Utilities Analysis

List of Figures

List of Tables

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Sanitary Sewerage System Facilities

Existing Sanitary Sewerage Facilities

The Green Bay Metropolitan Sewerage District (GBMSD) currently has one wastewater treatment facility, located at the mouth of the Fox River. In 1995, GBMSD's treatment facility serviced an estimated population of over 140,000. The sanitary sewer service area tributary to the treatment plant at the mouth of the Fox River includes the City of Green Bay, the Villages of Allouez, Ashwaubenon and Pulaski, as well as portions of the Village of Howard, Towns of Hobart, Bellevue, Scott, Green Bay, Red River, Lawrence and Ledgeview, and a portion of the Oneida Reservation.

Sanitary Sewerage System Plan

The Brown County Planning Commission is responsible for sewer service area planning within the county and they have produced a document that addresses the sewage needs of the county through the year 2015. The plan was adopted in June 1990, revised and adopted in August 1997, and is currently in the process of being updated. Several factors were taken into account when defining the sewer service area, including delineation of existing sewered areas, development trends, conformance with county and local comprehensive plans, demographics, employment and facilities plans.

The 1995 and projected 2015 populations and corresponding average flows serviced by GBMSD's treatment facility are detailed below.

Table 10-1: Sewered Population and Average Sewage Flows

Treatment Facility	Year 1995		Year 2015		Treatment Plant Design Flow (MGD)
	Sewered Population	Average Flow MGD	Sewered Population	Average Flow MGD	
Green Bay Metropolitan Sewerage District	141,503	27.7	170,425	35.3	49.2

For the City of Green Bay, it was estimated that 6,397 residential acres and 2,242 commercial-industrial acres will be needed (These are totals, not increases). The amount of land was judged to be enough so that land price inflation is not induced yet not so much that the local and regional investment in sewer lines is excessive.

Environmentally Sensitive areas (ESAs) are not included in the figures. ESAs include lakes and streams, wetlands, certain woodlands and steep slopes. The Natural Resources Analysis describes and locates the ESAs in Green Bay.

The 1995 Plan delineated the extent of Sewer Service Areas based on those land need forecasts mentioned above. Figure 10-1

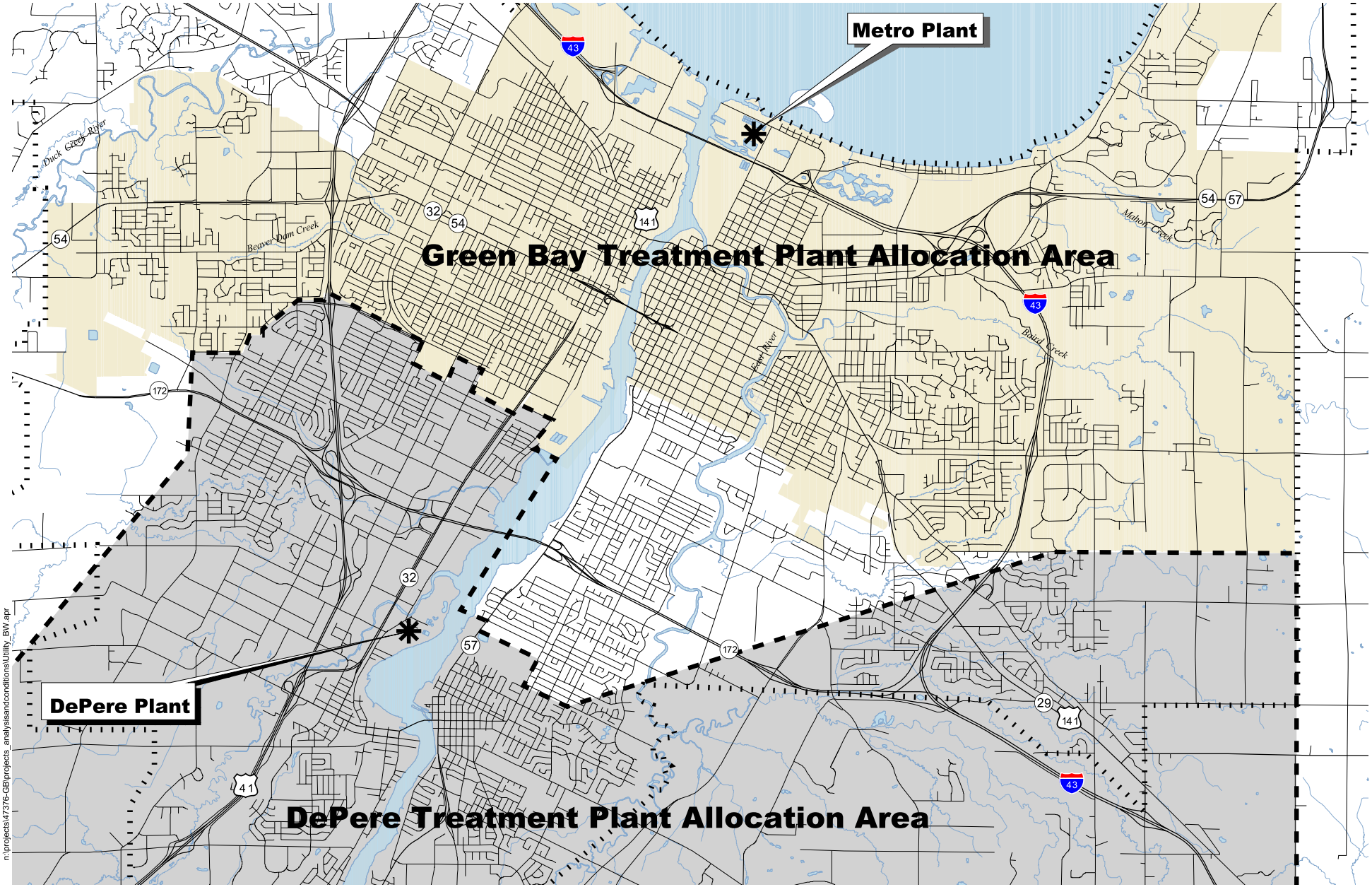
illustrates the fact that all of Green Bay is within a Sewer Service Area. Also within a Sewer Service Area are the Town of Ashwaubenon and part of the Towns of Scott and Howard.

Location of land within the 2015 Sewer Service Area does not necessarily mean that sewer service will immediately be made available – that is the decision of the local unit of government. Land contiguous to a serviced area should be served before land requiring a major extension of sewer lines. Thus, Green Bay has decided to stage the outward extension of its lateral lines from the regional interceptor line.

Additional recommendations of this plan include the following:

- Encourage land development to proceed outward from the existing developed core.
- Encourage the use of the existing collection and treatment facilities which have unused, unallocated capacity prior to the extension of new collection and treatment facilities.
- For known and potential on-site problem areas within the County, ensure that any facilities planning studies investigate the appropriateness of innovative on-site systems as well as the more traditional, off-site collection and treatment facilities.
- Utilize recent on-site system development activity within each community as a criteria to determine future sewer service area acreage allocations.
- Discourage sewer extensions into environmentally sensitive areas (ESAs).
- Design and construct those sanitary sewers which must cross or follow environmentally sensitive areas so that once they are placed, they will not have to be replaced or augmented and so that they will not permanently disturb the areas. ESA's disturbed as a result of extending sewers shall follow the guidelines of the Brown County Planning Commission's approved Restoration Plan.

As part of the plan it was noted that improvements to the existing treatment facility and interceptor lines must be made to handle future wastewater flow projections.



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Treatment Plant

Year 2015 Sanitary Sewer Service Area (Approx.)

Treatment Plant Allocation Area Boundary

Figure 10-1

Sewage Treatment Service Areas

0 2000 4000 8000 feet

NORTH

Water Supply Facilities

Existing Water Supply Facilities

The Green Bay Water Utility (GBWU) is charged with operating and planning improvements for the City's water supply system. The 1999 population served by the GBWU was approximately 98,000. In 1999, the average day water use was approximately 18.5 million gallons per day (MGD). The maximum day was approximately 28.5 MGD. Major components of the existing water treatment and supply facilities for the City of Green Bay are summarized as follows:

- **Lake Michigan Intake Pipes** – Water is withdrawn from the Lake by gravity through two 42-inch diameter intake lines. The first pipe is 6,000 feet long and was constructed in 1955. The second pipe is 3,000 feet long and was constructed in 1968. Together the intake pipes have a capacity of 60 MGD.

- **Raw Water Pumping Station (Lake Station)** – Water is pumped into the Raw Water Transmission Main through the use of six pumps that range from 600 to 800 horsepower each. Each pump has a capacity of 8 MGD.

- **Raw Water Transmission Main** – One 42-inch main transmits water between the Lake and the water treatment plant. This length of the main is approximately 14.6 miles. The capacity of this main ranges from 23.5 to 42 MGD.

- **Raw Water Booster Station** – The raw water booster station consists of two 1,750 horsepower pumps, one with a 35 MGD capacity and one with a 37 MGD capacity. There is a 1,000,000-gallon reservoir at the booster station site.

- **Water Treatment Plant** – The capacity of the water treatment plant is 24 MGD. Capacity can be increased to 28 MGD for short periods of time.

- **Treated Water Transmission Mains** – Two treated water transmission mains leave the plant. One transmission main is located on the north side of Finger Road; one is located on the south side of the road. Both are prestressed concrete and are 36 inches in diameter.

The distribution system is divided into nine separate pressure zones. Within each pressure zone is an integrated system consisting of pressure reducing valves, booster pumps, elevated storage tanks, ground reservoirs, smaller diameter water mains and service connections.

The GBWU maintains nine ground water wells. These wells are maintained to provide excess capacity during seasonal peaks and for back-up.

Water Supply System Plan

It should be noted that the City is in the process of improving the capacity of the water system. Upon completion of Phase II of the current plan, the City will have a Lake Michigan water supply capacity of approximately 42 MGD and back-up well capacity of approximately 11.4 MGD.

Plans for future development of the City's water supply system is summarized in a document entitled *Water System Strategic Plan.* The strategic plan is intended to guide the development of the City's water system through 2050.

As part of the process, population projections were developed by several agencies including the U.S. Census Bureau, the Wisconsin Department of Administration and the Applied Population

Laboratory at the University of Wisconsin. Projections were also developed from historical water meter data. Population projections for 2050 ranged from about 131,200 to 148,800. Population projection indicated that future average day water demands would range between about 30 and 34 MGD. It was concluded that the University of Wisconsin Applied Population Laboratory medium to high projections should be used because socioeconomic factors were included. The following projected water system demands were used in developing the Strategic Plan:

Table 10-2: Projected Water System Demands

Year	Average Day (MGD)	Maximum Day without Needed Fire Flow (MGD)	Maximum Day with Needed Fire Flow (MGD)
2010	22	38	42
2020	24	42	46
2030	26	46	50
2040	29	50	54
2050	32	55	59

Using these projected water capacity needs, the following conclusions regarding water supply system improvements were reached:

- No capacity improvements to the Lake Michigan Intake Pipes are required to meet 2050 demand.
- Three additional pumps will needed at the Lake Shore Pumping Station
- Additional capacity will be required in the Raw Water Transmission Main. This will likely involve the construction of 14.6 miles of 48-inch water main around 2010.
- The Water Treatment Plant will require additional capacity including: ozination, rapid mix, settling basins, wash water tank and pumps, and filters.
- A new 38,700-foot long 48-inch diameter transmission main will be needed from the Water Treatment Plant along Jossard Road, C.T.H. "N" and Humboldt Road, to the existing 36-inch main in Grandview Road.
- A new 23,500-foot long 36-inch diameter transmission main will be needed in Humbolt Road and University Avenue between Spartan Road and Grove Street.

With regard to areas of growth, the following conclusions were reached in the *Water System Plan*:

- It is anticipated that water consumption in the John Street, 7th Street, Lime Kiln Road and Alpine Drive/Edgewood Drive Pressure Zones will remain stable, with very minimal changes.
- Substantial new development will occur in vacant areas in the southwest, west and north parts of the Grandview Pressure Zone, in the east part of the Mt. Mary Drive Pressure Zone and the northeast part of the Badger Street Pressure Zone. A lesser amount of development is anticipated in the Hobart Drive and Lime Kiln Road Pressure Zones.

It should also be noted that the City is in negotiation with the surrounding communities to sell water.

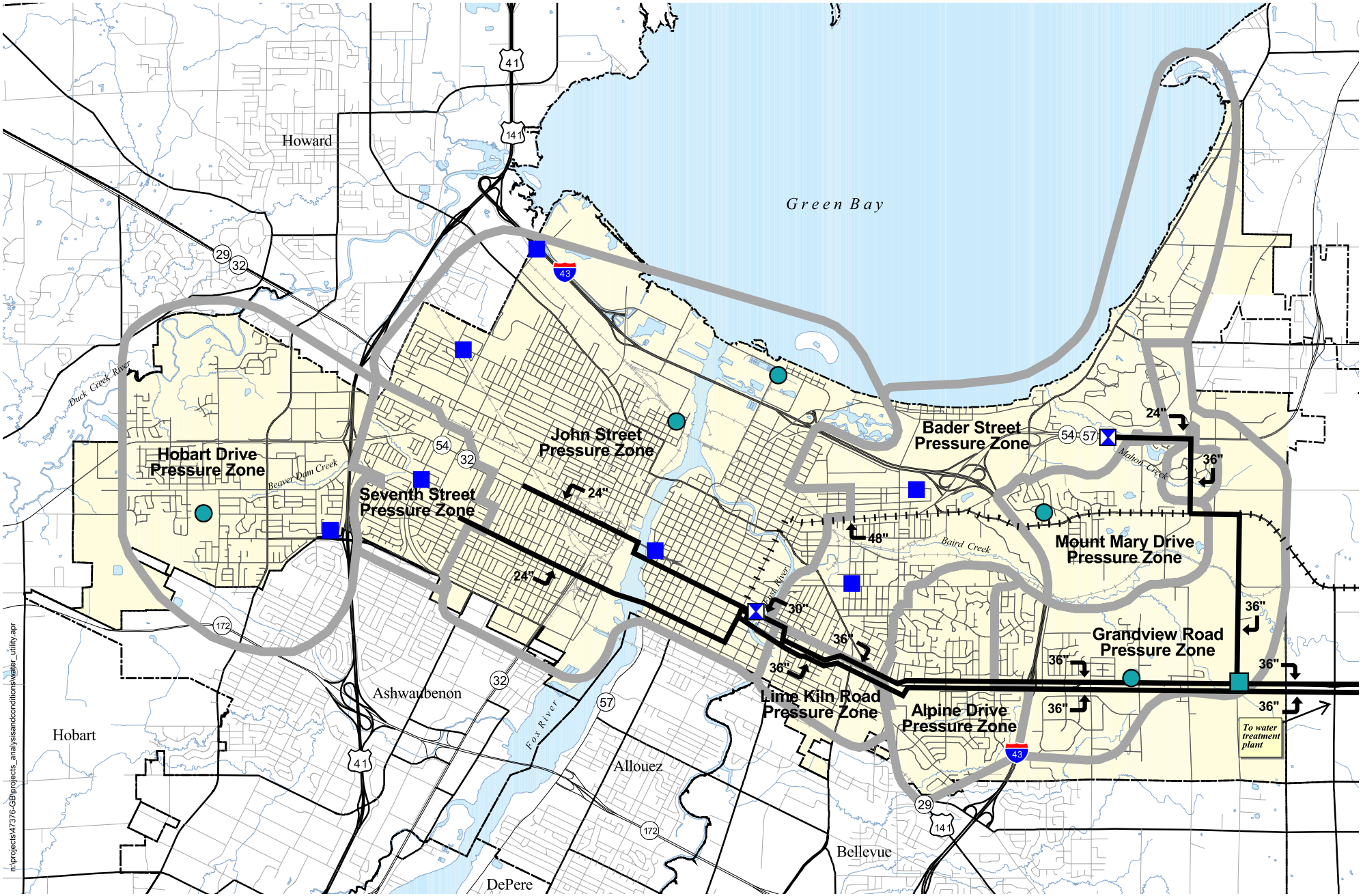

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Figure 10-2

Water System Plan

Utilities System Issues

Both the sewer and water analyses raise one primary issue: ***how can planning for utilities expansion be made consistent with the City's Comprehensive Plan?*** Clearly, the City's planning process is still in the early stages – reviewing conceptual alternatives for a future development pattern. However, it is likely that there will be differences between any alternative that is chosen and the existing utility plans.

Specifically, the following issues should be addressed:

- **Coordination with Brown County:** Brown County is in the process of updating its Sanitary Sewerage System Plan. How can the City's planning process best be coordinated with the County's update? Are there obvious inconsistencies that should be addressed?

- **Discrepancies in Forecasting Assumptions:** The Green Bay Water Utility has allocated future capacity based on development in certain parts of the City. Are there likely to be differences or inconsistencies between these projections and the City's plan? How should such differences be addressed?